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transducer module 14 comprises a 50 W piezoelectric transducer 16 which resonates at 20 kHz, attached to a conically flared titanium coupling block 18 by which it is connected to the wall, the wider end of each block being of diameter 63 mm. The transducer modules 14 are arranged in five circumferential rings each of twelve modules 14, the centres of the coupling blocks 18 being on a square pitch of 82 mm. The irradiator 10 also incorporates five signal generators 20 (only one is shown) each of which drives all the transducers 16 in a ring. All the transducers 16 are activated at 20 kHz. --

Page 6, delete the paragraph extending from line 8 through line 3 of page 7, and substitute the following:

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--Referring now to FIGS. 2 and 3 there is shown an alternative irradiator 30 which has many features in common with that of FIG. 1. The irradiator 30 includes a generally cylindrical duct 32 of polytetrafluoroethylene (PTFE) of internal diameter 0.31 m and of wall thickness 3 mm, which tapers at each end down to an internal diameter of 0.10 m and a wall thickness of 6 mm provided with a flange 33 for connection to other process ducts (not shown), and has a sealed joint 34 for inspection or cleaning purposes. Around the outside of the duct 32 is a concentric stainless-steel tube 35 of wall thickness 1 mm and of external diameter 0.354 m, such that there is a gap 36 of width 18 mm between the duct 32 and the tube 35. Sixty transducer

B3 modules 14 are attached to the outer surface of the tube 35 in a rectangular array forming five rings of twelve, the spacing between the centres of the coupling blocks 18 being 82 mm parallel to the longitudinal axis of the tube 35 and 92.7 mm circumferentially. The array of transducers 14 is enclosed by an acoustic shield 38. A coupling liquid such as olive oil 40 is used to fill the gap 36 and is re-circulated from a reservoir 42 by a pump 44. This coupling liquid has a higher threshold for cavitation than water, and has an impedance which is between that of the titanium coupling block 18 and that of the fluid within the duct 32 (typically mainly water, or an industrial solvent); at a frequency of 20 kHz the wavelength of the sound in this oil is 72 mm, so that the gap 36 is of width equal to a quarter of the wavelength.--

Page 7, delete the paragraph in lines 5-13 and substitute the following:

-- In use of the irradiator 30, a liquid is caused to flow through the duct 32 and each transducer 16 is activated by a power supply (not shown) at 20 kHz. The dissipated power

B4 intensity and power density are as described in relation to FIG.

1. The impedance matching provided by the oil in the gap 36 allows more of the applied power to enter the fluid within the duct 32 while reducing erosion at the inner, irradiating, surface of the tube 35.--